UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667,633	09/22/2003	Christopher Cave	I-2-0390.1US	1103

24374 7590 07/28/2005

VOLPE AND KOENIG, P.C.
DEPT. ICC
UNITED PLAZA, SUITE 1600
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER	
LAM, DUNG LE	

ART UNIT	PAPER NUMBER
2687	

DATE MAILED: 07/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/667,633	CAVE ET AL.	
	Examiner	Art Unit	
	Dung Lam	2687	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,9,11-19,21-32 and 34-44* is/are rejected.

7)☐ Claim(s) *7,8 and 33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *23 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date ___.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)–(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The references listed in the Information Disclosure Statement submitted on April 22, 2004 have been considered by the examiner (see attached PTO-1449 form).

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-14 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding **claim 1**, it is not clearly claimed which element of the network is doing the selecting of the second base station and based on what criteria is the base station selected from a plurality of base stations.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which

said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. **Claims 1, 12-14, 15, 22-25, 27-28, 29, 39, 40, 42 and 43** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Anderson et al.** (US Patent No. 6088590) in view of **Freeburg** (US Patent No. 5095535).

6. Regarding **claim 1**, Anderson teaches a radio network having a plurality of base stations, each providing wireless communication services for mobile units in a respective geographic coverage area that may or may not overlap with the geographic coverage areas of other of the base stations, and an interface (BSC 408, Figure 4) connected to the base stations (410, 406), method of handoff a wireless communication with a mobile unit conducted via a first base station to a second base station comprising: detecting a handover trigger event during the mobile unit's wireless communication via the first base station (Col. 15, lines 53-55);

Anderson fails to specifically teach that the signal being sent by the mobile and detected by the base station is an omnidirectional sounding pulse. In an analogous art, Freeburg teaches that sounding pulse is used to overcome multipath problem (Col. 5,lines 37-50). Since multipath is a common problem in telecommunications, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify Anderson's handover method to include Freeburg's teaching of the use of sounding pulse as the type of transmitting and detected signal to reduce multi-path thereby increases the quality of the reception.

Anderson further teaches communicating information related to the detected sounding pulse to the interface by each base station detecting the sounding pulse;

selecting the second base station from the base stations that detected the sounding pulse based on the communicated information (Col. 16, lines 64-68);

and continuing the mobile unit's wireless communication via the selected second base station (Col. 17, lines 15-20).

7. Regarding **claim 12**, Anderson and Freeburg teach all the limitations of the method of claim 1. However, they fail to teach that the mobile unit is equipped with a global positioning system (GPS) and the transmitting of an omnidirectional sounding pulse includes transmitting of mobile unit location information associated with the sounding pulse transmitted by the mobile unit and/or includes transmitting of identification information associated with the sounding pulse transmitted the mobile unit. Nonetheless, it is well known in the art that mobile unit is equipped with GPS in facilitating the mobile positioning process. Therefore it would have been obvious for one of ordinary skill in the art at the time of the invention to add the GPS in the mobile to speed up the location positioning of the handset.

8. Regarding **claim 13**, Anderson and Freeburg teach all the limitations of the method of claim 1. They fail to explicitly teach that the transmitting of an omnidirectional sounding pulse includes transmitting a subsequent sounding pulse of increased power by the mobile unit if handover does not occur within a predefined time period from its transmitting of an omnidirectional sounding pulse. However, Anderson teaches a method of adjusting the power to a higher or lower level if the mobile is far or close from the base stations respectively (Col. 9, lines 6-15). In addition, it is also well known in the field of communications that after a failed transmission, one of ordinary skill in the art may use back-off algorithm to resend the signal in a predefined period of time.

Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify Anderson and Freeburg's teaching of a handoff method to retransmit the signal with increasing power (if the mobile is far away from the base station) at a predefined period to increase the chance of a successful handoff.

9. Regarding **claim 14**, Anderson and Freeburg teach all the limitations of the method of claim 1. They fail to explicitly teach that the transmitting of an omnidirectional sounding pulse includes transmitting a series of omnidirectional sounding pulses of increasing power from the mobile unit. However, Anderson teaches a method of adjusting the power to a higher or lower level if the mobile is far or close from the base stations respectively (Col. 9, lines 6-15). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify Anderson and Freeburg's teaching of a handoff method to retransmit the signal with increasing power (assuming the mobile is far away from the base station) to increase the chance of a successful handoff.

10. Regarding **claim 15**, it is an apparatus claim corresponding to the method claim number 1. Therefore, it is rejected for the same reasons as claim 1.

11. Regarding **claim 22**, it is a subset of claim 15 which is an apparatus claim corresponding to the method claim number 1. Therefore, it is rejected for the same subset of reasons as in claim 1.

12. Regarding **claim 23**, Anderson and Freeburg teach all the limitations of the method of claim 1. They fail to explicitly teach the mobile units are each configured to

monitoring the power level of a directed communication beam from a base station that is received by the mobile unit and to transmit an omnidirectional sounding pulse if the monitored power level falls below a predefined level. However, Anderson teaches that the base station sends a message to inform the user station to adjust its power if needed to reduce interference (Col. 9, lines 35-46). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify Anderson and Freeburg's teaching of a handoff method to be capable of adjusting power to an appropriate level to reduce interference.

13. Regarding **claim 24**, it is an apparatus claim corresponding to the method claim number 13 previously addressed. Therefore, it is rejected for the same reasons as in claim 13.

14. Regarding **claim 25**, it is an apparatus claim corresponding to the method claim number 12 previously addressed. Therefore, it is rejected for the same reasons as in claim 12.

15. Regarding **claim 27,** it is a subset of limitations of claim 15. Therefore, claim 27 is rejected for the same subset of reasons as claim 15.

16. Regarding **claim 28,** it is a subset of limitations of claim 15. Therefore, claim 28 is rejected for the same subset of reasons as claim 15.

17. Regarding **claim 29**, it is an apparatus claim corresponding to the method claim number 13 previously addressed. Therefore, it is rejected for the same reasons as in claim 13.

18. Regarding **claim 39,** it claims a mobile unit, which corresponds to the method claim 1. Therefore, it is rejected for the same reasons as claim 1.

19. Regarding **claim 40,** it claims a mobile unit, which corresponds to the method claim 13. Therefore, it is rejected for the same reasons as claim 13.

20. Regarding **claim 41** it claims a mobile unit, which corresponds to the method claim 12 previously addressed. Therefore, it is rejected for the same reasons as in previous claim 12.

21. Regarding **claim 42**, Anderson and Freeburg teach all the limitations of the method of claim 39. They fail to teach that the mobile unit is configured to transmit of an omnidirectional sounding pulse that includes mobile unit identification information. However, Anderson teaches that the mobile responds to a poll message with its identification (Col. 12, lines 52-58). Therefore, it would have been obvious for one of ordinary skill in the art at the time of the invention to modify Anderson's method of handover to send out the signal with an ID for easy identification purpose.

22. Regarding **claim 43,** it claims a mobile unit, which corresponds to the method claim 13 previously addressed. Therefore, it is rejected for the same reasons as in previous claim 13.

23. Claim **2, 3, 9-11, 16-17, 20-21, 26, 30, 31, 44** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Anderson et al.** (US Patent No. 6088590) in view of **Freeburg** (US Patent No. 5095535) further in view of **Keskitalo** (US Patent No. 5893033).

24. Regarding **claim 2,** Anderson and Freeburg teach all the limitations of the method of claim 1. However, they fail to teach that each base station has a selectively operable beamforming antenna that can determine the location of the mobile and steer the channels toward the mobile's location. In an analogous art, Keskitalo teaches that each base station has a selectively operable beamforming antenna, and further comprising: determining a relative location of the mobile unit with respect to the beamforming antennas of base stations neighboring the first base station (Col. 9, lines 41-45) and directing beacon channels of the neighboring base stations toward the mobile unit location to receive the transmitted sounding pulse (Col. 9, lines 63-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the handover method to include the step of determining the mobile's location and direct the channels toward the mobile's location to have a better signal quality.

25. Regarding **claim 3**, Anderson and Freeburg teach all the limitations of the method of claim 1. However, they fail to teach that each base station has a selectively operable beamforming antenna that can determine the location of the mobile and sweep beacon channels over an arc. In an analogous art, Keskitalo teaches a step of determining a relative location of the mobile unit with respect to the beamforming

antennas of base stations neighboring the first base station (Col. 9, lines 41-45) and commanding the neighboring base stations to sweep beacon channels over an arc encompassing the mobile unit location to receive the transmitted sounding pulse (Col. 9, lines 4-5 and Col. 9, lines 63-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the handover method to include the step of determining the mobile's location and sweep the channels over an arc to search for the best signal components as taught by Keskitalo (Col. 9, 14-16).

26. Regarding **claim 9**, it is a combination of claims 1 and 3. Therefore, it is rejected for the same reasons as claims 1 and 3.

27. Regarding **claim 10**, Anderson, Freeburg and Keskitalo teaches all the limitations as in claim 9. However, they fail to teach that Node B is configured to operate its antenna to form a communication beam that carries common channels that encompasses the relative location of a plurality of UEs so that the formed beam provides common channel service to a plurality of UEs. Nonetheless, it is a practical design system to service a plurality of UEs rather than a single one to increase capacity of the system. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to service multiple UEs to maximize system capacity.

28. Regarding **claim 11**, Anderson and Freeburg teach all the limitations of the method of claim 1. However, they fail to teach that the mobile unit has a selectively operable beamforming antenna and transmitting an omnidirectional sounding pulse from the mobile unit is performed by transmitting multiple sounding pulses that sweep through

360 degrees or a set of calculated arcs. In an analogous art, Keskitalo teaches that a sweep of an antenna beam over a given area (Col. 9, lines 4-5). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the handover method to include the step of determining the mobile's location and sweep the channels over an arc to search for the best signal components as taught by Keskitalo (Col. 9, 14-16).

29. Regarding **claims 16 and 17**, they are apparatus claims corresponding to the method claims number 2 and 3 respectively. Therefore, they are rejected for the same reasons as claim 2 and 3.

30. Regarding **claim 20**, Anderson, Freeburg and Keskitalo teaches all the limitations as in claim 19. However, they fail to teach that Node B is configured to operate its antenna to form a communication beam that carries common channels that encompasses the relative location of a plurality of UEs so that the formed beam provides common channel service to a plurality of UEs. Nonetheless, it is a practical design system to service a plurality of UEs rather than a single one to increase capacity of the system. Therefore, it would have been obvious to a person of ordinary skill in the art at the time of the invention was made to service multiple UEs to maximize system capacity.

31. Regarding **claim 21**, it is an apparatus claim corresponding to the method claim number 2. Therefore, it is rejected for the same reasons as claim 2.

32. Regarding **claim 26**, it is an apparatus claim corresponding to the method claim number 11. Therefore, it is rejected for the same reasons as claim 11.

33. Regarding **claim 30**, it is an apparatus claim corresponding to the combined method claims number 1 and 2. Therefore, it is rejected for the same set of reasons as claim 1 and 2.

34. Regarding **claim 31**, it is an apparatus claim corresponding to another variation of the combined method claims 1 and 2. Therefore, it is rejected for the same set of reasons as claim 1 and 2.

35. Claim **4, 18, 44** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Anderson et al.** (US Patent No. 6088590) in view of **Freeburg** (US Patent No. 5095535) further in view of **Bark et al.** (US Patent No. 6445917).

36. Regarding **claim 4**, Anderson and Freeburg teach all the limitations of the method of claim 1. However, they fail to teach that the radio network is a UMTS Terrestrial Radio Access Network (UTRAN), each base station is a Node B, the interface is a Radio Network Controller (RNC) and the mobile unit is a mobile User Equipment (UE);

In an analogous art, **Bark** teaches a UMTS Terrestrial Radio Access Network (UTRAN) (**24**, see Figure 1A), each base station is a Node B (**28**), the interface is a Radio Network Controller (RNC) **26** and the mobile unit is a mobile User Equipment (3G terminology); the communicating information is between Node Bs and the RNC via an Iub or combination Iub/Iur interface (Col. 5, lines 44-45, and 3G standards); the second base station selection is performed by the RNC by selecting a second Node B (col. 8, lines 50-55); and the UE's communication continued via the second Node B is via a Uu

interface (inherent). UMTS is a system used in the 3G which is gaining increasing popularity. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the handover method to also establish this handover method in the UMTS system to keep the network system up-to-date with the current technology.

37. Regarding **claim 18,** it is an apparatus claim corresponding to the method claim number 4. Therefore, it is rejected for the same reasons as claim 4.

38. Regarding **claim 44** it claims a mobile unit, which corresponds to the method claim 11 previously addressed. Therefore, it is rejected for the same reasons as claim 11.

39. Claims **5, 6, 19, 32, 34-38** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Anderson et al.** (US Patent No. 6088590) in view of **Freeburg** (US Patent No. 5095535) further in view of **Bark et al.** (US Patent No. 6445917) further in view of **Keskitalo** (US Patent No. 5893033).

40. Regarding **claim 5**, **Anderson, Freeburg and Bark** teach all the limitations of the method of claim 4. However, they fail to teach that each Node B has a selectively operable beamforming antenna, further comprising: determining a relative location of the UE unit with respect to the beamforming antennas of Node Bs neighboring the first Node B and directing beacon channels of the neighboring Node Bs toward the UE location to receive the transmitted sounding pulse. In an analogous art, **Keskitalo** teaches a step of determining a relative location of the UE unit with respect to the beamforming

antennas of Node Bs neighboring the first Node B and directing beacon channels of the neighboring Node Bs toward the UE location to receive the transmitted sounding pulse (Col. 9, lines 63-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the handover method to include the step of determining the mobile's location and direct the channels toward the mobile's location to have a better signal quality.

41. Regarding claim **6, Anderson, Freeburg and Bark** teach all the limitations of the method of claim 4. However, they fail to teach that each Node B has a selectively operable beamforming antenna, further comprising: determining a relative location of the UE unit with respect to the beamforming antennas of Node Bs neighboring the first Node B and commanding the neighboring Node Bs to sweep beacon channels over an arc encompassing the mobile unit location to receive the transmitted sounding pulse. In an analogous art, **Keskitalo** teaches a that each Node B has a selectively operable beamforming antenna, further comprising: determining a relative location of the UE unit with respect to the beamforming antennas of Node Bs neighboring the first Node B and commanding the neighboring Node Bs to sweep beacon channels over an arc encompassing the mobile unit location to receive the transmitted sounding pulse (Col. 9, lines 4-5 and Col. 9, lines 63-65). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the handover method to sweep the channels over an arc to search for the best signal components (Keskitalo, Col. 9, lines 14-16) in the 3G environment to make the network more interface-able with other networks.

42. Regarding **claim 19,** it is an apparatus claim corresponding to the method claim number 5. Therefore, it is rejected for the same reasons as claim 5.

43. Regarding **claim 32**, it is a combination of method claims 1, 2, and 4. Therefore, it is rejected for the same set of reasons as claim 1, 2 and 4.

44. Regarding **claim 34 and 35**, it is a combination of method claims 1 and 2. Therefore, it is rejected for the same set of reasons as claim 1 and 2 (See claims 1 and 2).

45. Regarding **claim 36, 37 and 38**, they are method claims that correspond to previous method claims of 11, 12 and 13. Therefore, they are rejected for the same of reasons as claim 11, 12 and 13.

Allowable Subject Matter

46. Claims **7, 8 and 33** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

47. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung Lam whose telephone number is (571) 272-6497. The examiner can normally be reached on M - F 8-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on (571) 272-7922. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-6497.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

DL

7/24/2005

7/25/05

LESTER G. KINCAID
SUPERVISORY PRIMARY EXAMINER